

WHAT IS CLAIMED IS:

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1. A printing unit comprising:
a rigid cylinder rotatable about an axis of rotation;
a plurality of inflatable bladders disposed on a circumferential surface of the cylinder;
a first fluid supply regulation unit configured to supply a first fluid to a first set of inflatable bladders of the plurality of inflatable bladders and to regulate a first fluid pressure inside the first set inflatable bladders; and
a flexible cylinder covering disposed over an outer surface of the plurality of bladders.

2. The printing unit as recited in claim 1 wherein the first set of inflatable bladders include all of the plurality of inflatable bladders.

3. The printing unit as recited in claim 1 wherein the flexible cylinder covering includes a single-layer material and is disposed adjacent to the outer surface of the plurality of bladders.

4. The printing unit as recited in claim 2 further comprising a printing sock removably disposed over a circumferential surface of the flexible cylinder covering.

5. The printing unit as recited in claim 4 wherein the printing sock is sleeve-shaped.

6. The printing unit as recited in claim 1 further comprising a second fluid supply regulation unit configured to supply a second fluid to a second set of inflatable bladders from the plurality of inflatable bladders and to regulate a second fluid pressure inside the second set of inflatable bladders.

The printing unit as recited in claim 6 further comprising a first fluid line connecting the first fluid supply regulation unit to the first set of bladders and a second fluid line connecting the second fluid supply regulation unit to the second set of inflatable bladders.

8. The printing unit as recited in claim 6 wherein the first and second fluid supply regulation units are configured to regulate the first and second fluid pressures while the cylinder is rotating about the axis.

9. The printing unit as recited in claim 7 wherein first and second fluid lines include a rotary union configured to enable the first and second fluid to flow through the first and second fluid lines while the cylinder is rotating about the axis.

10. The printing unit as recited in claim 6 wherein the first and second fluids include at least one of air and a hydraulic fluid.

11. The printing unit as recited in claim 1 further comprising a first heat exchanger connected to the first fluid regulation unit and wherein the first regulation unit is configured to circulate the first fluid between the first set of inflatable bladders and the first heat exchanger.

12. The printing unit as recited in claim 11 wherein each of the plurality of bladders forms a ring around the circumference of the cylinder.

13. A blanket cylinder for an offset printing press comprising:
a rigid cylinder rotatable about an axis of rotation;
a plurality of ring-shaped inflatable bladders disposed on a circumferential surface of the cylinder and each configured to encircle the circumference of the cylinder;
a fluid supply regulation unit configured to supply a fluid to a set of inflatable

bladders of the plurality of inflatable bladders and to regulate a fluid pressure inside the first set inflatable bladders;

a single-layer flexible cylinder covering disposed over an outer surface of the plurality of bladders; and

a sleeve-shaped printing sock removably disposed over a circumferential surface of the flexible cylinder covering.

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14. A method for mounting a sleeve-shaped printing sock onto a blanket cylinder of an offset printing press, the method comprising:

at least partially deflating a set of inflatable bladders disposed at an outer region of the blanket cylinder;

positioning the sleeve-shaped printing sock over one end of the blanket cylinder so that the printing sock at least partially surrounds a circumference of the blanket cylinder; and

inflating the set of inflatable bladders so that the printing sock fits tightly around the circumference of the blanket cylinder.

15. The method as recited in claim 14 further comprising adjusting a fluid pressure inside the set of inflatable bladders according to a desired printing quality.